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*O.W.R.C.
Water Pollution Survey*

THE
ONTARIO WATER RESOURCES
COMMISSION

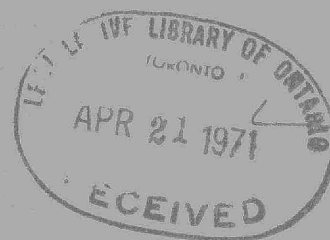
WATER POLLUTION SURVEY

of the

COMMUNITY OF OPASATIKA

DISTRICT OF COCHRANE

1971



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R E P O R T

on a

WATER POLLUTION SURVEY

of the

COMMUNITY OF OPASATIKA

TOWNSHIP OF IDINGTON (UNORGANIZED)

DISTRICT OF COCHRANE

January 1971

DISTRICT ENGINEERS BRANCH

DIVISION OF SANITARY ENGINEERING

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R E P O R T

THE ONTARIO WATER RESOURCES COMMISSION

INTRODUCTION

A water pollution survey of the Community of Opasatika was conducted in September, 1970. The purpose of the survey was to locate and record all significant sources of water pollution within the townsite, and to make recommendations concerning their abatement.

The Ontario Water Resources Commission is concerned with the management of the province's water resources as they are related to the needs of water supply, waste water disposal and other areas of use. In keeping with this responsibility the Commission examines water quality in areas of active and potential use.

The assistance provided during this survey by the Department of Health Regional Laboratory in Timmins, and the Porcupine Health Unit, is gratefully acknowledged.

I GENERAL INFORMATION

The Community of Opasatika is located on Highway No.11 in the Township of Idington (unorganized), District of Cochrane. The townsite is municipally unorganized and has an estimated population of 700 persons. The residents rely economically on the pulp and paper mills in Kapuskasing

and logging operations in the local woodlots.

The townsite is located on a clay belt primarily composed of the varved clay and silts commonly found in Northern Ontario. Generally the terrain is of a flat or rolling nature with no rock close to the surface.

II WATER SUPPLY

Domestic water supplies are obtained from individually-owned drilled and dug wells. Fifteen water samples were collected at random from the wells within the townsite.

Bacteriological examinations revealed that one (#24-W) of these samples was adverse. Bacteriological results of samples taken during past years by the Porcupine Health Unit indicated several of the private wells to be of doubtful or unsatisfactory quality. Field observations at the time of the survey would seem to attribute most adverse results to poor construction and/or location of wells relative to waste disposal systems.

Chemical analyses were performed on two of the well samples. High concentrations of hardness as CaCO_3 were noted in each sample. Hardness is undesirable in water supplies because it creates laundering problems, and may cause encrustations to form on cooking utensils and water heaters.

Sample No. 3-W also contained concentrations of iron and phenols in excess of the Commission's objectives of 0.3 ppm. and 1.0 ppb. respectively. Excessive iron may tend to stain laundry and porcelain fixtures. Phenols tend to create an unpalatable taste in drinking water.

Due to the limited number of tests on well water, a general statement of the water quality cannot be made at this time. Laboratory results of the samples discussed above are presented in Tables 1-A and 1-B.

III WATER POLLUTION

(1) Sanitary Waste Disposal

There is no communal sewage collector system. Sanitary wastes are disposed of in individual septic tanks with tile fields and privies. Several of these private facilities are not operating properly due to the heavy clay overburden that prevails throughout this claybelt region.

In order for a septic tank and tile bed system to work efficiently the soil must be suitable for the absorption of effluent; i.e. an acceptable percolation rate without interference from ground water or impervious strata below the level of the absorption system. These conditions do not prevail within the townsite. The conditions evident at

the time of the field survey constituted a health hazard with nuisance odours and an unsightly appearance.

A sewage collector system and treatment facility should be implemented as soon as possible.

(2) Sample Analyses

The laboratory results of the bacteriological examinations and chemical analyses, of the samples collected from the local ditches throughout the townsite, are presented in this report in Tables 2-A and 2-B.

All bacteriological samples were submitted to and examined by the Department of Health Regional Laboratory in Timmins. The chemical samples were analysed at the Ontario Water Resources Commission Laboratories in Toronto.

A plan of the Community of Opasatika showing the approximate location of the sampling points is enclosed in this report.

It is pointed out that nearly all of the samples collected from the local ditches contained total coliform counts, biochemical oxygen demands (BOD's) and suspended solids concentrations, much in excess of the Commission's objectives for surface waters. These and other surface water objectives are discussed in detail in the Appendix of this report.

IV REFUSE DISPOSAL

A garbage collection service is available to the residents of the community. Reportedly, most of the residents are using this service. All collected refuse is disposed of on a sanitary landfill site provided by the Ontario Department of Lands and Forests.

V SUMMARY AND CONCLUSIONS

A water pollution survey of the Community of Opasatika was conducted in September of 1970.

Several malfunctioning septic tank systems are discharging inadequately treated sanitary wastes to the local ditches within the townsite, and are creating a public health hazard.

Soil conditions throughout the townsite are generally not suitable for the proper operation of septic tank and tile bed systems.

Several of the homes are located close together on small lots, further hindering the operation of the individual tile bed systems.

Nearly all of the samples collected from the local ditches throughout the townsite were found to be adverse with respect to the Commission's bacteriological and chemical objectives for surface waters.

VI RECOMMENDATIONS

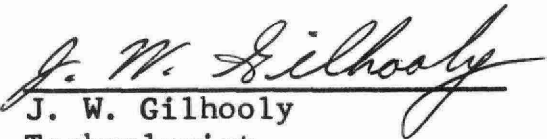
(1) It is recommended that the residents of Opasatika organize a committee to study the feasibility of constructing a communal sewage collector system and treatment facility.

(2) The above committee should also consider the advantages of providing a communal water works system throughout the townsite.

(3) Most of the roadside ditches throughout the townsite are presently posing a public health hazard. Until such time as adequate sanitary waste disposal facilities have been constructed, every effort should be made to improve the operation of existing septic tank and tile bed systems.

/fp

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LABORATORY RESULTS OF SAMPLES

TABLE 1-A

BACTERIOLOGICAL EXAMINATION OF PRIVATEWELL SUPPLIES

SAMPLING POINT NO.	LOCATION	DATE	MPN Coliform Organisms per 100 ml.	
			<u>FECAL</u>	<u>TOTAL</u>
3-W	Home in west end of Community Facing Hwy. No. 11.	Sept. 30/70	0	0
4-W	Home in west end of Community facing Hwy. No. 11.	Sept. 30/70	0	0
6-W	ESSO service stn. at west end of Community.	Sept. 30/70	0	0
11-W	Home in west end of Community facing Hwy. No. 11.	Sept. 30/70	0	0
15-W	Home on west side of lane to the north of Hwy. No. 11.	Sept. 30/70	0	0
16-W	Home on east side of lane to the north of Hwy. No. 11.	Sept. 30/70	0	0
20-W	Home on east side of St. Joseph Street.	Sept. 30/70	0	0
23-W	Home on west side of St. Anne Street.	Sept. 30/70	0	0

Table 1-A Continued...

SAMPLING POINT NO.	LOCATION	DATE	MPN Coliform Organisms per 100 ml.	
			<u>FECAL</u>	<u>TOTAL</u>
24-W	Home on Hwy. No. 11 east of St. Anthony St.	Sept. 30/70	8	20
26-W	Home on Hwy. No. 11 at east end of Community.	Sept. 30/70	0	0
28-W	Former C.N.R. Station (presently Caisse Populaire).	Sept. 30/70	0	0
29-W	Home on Hwy. No. 11 between St. Frances and St. Joseph Sts.	Sept. 30/70	0	0
30-W	Home on west side of St. Joseph St.	Sept. 30/70	0	0
31-W	Home on Hwy. No. 11 at east end of Community.	Sept. 30/70	0	0

TABLE 1-B

CHEMICAL ANALYSES RESULTS OF PRIVATE WELL SUPPLIES

<u>Sampling Point No.</u>	<u>Location</u>	<u>Date</u>	<u>Hardness as CaCO₃ in ppm</u>	<u>Alkalinity as CaCO₃ in ppm</u>	<u>Iron as Fe (ppm)</u>	<u>Chloride as Cl (ppm)</u>	<u>pH at Lab.</u>	<u>Phenols in ppb</u>
20-W	Home on east side of St. Joseph Street	Dec.10/70	388	413	.05	26	7.5	0
3-W	Home at west end of townsite on Hwy.No. 11	Dec.10/70	228	287	1.95	1	8.0	3

TABLE 2-A

BACTERIOLOGICAL EXAMINATION OF LOCAL

Sampling Point No.	Location	Date	MPN	
			Coliform Organisms per 100 ml.	
			<u>Fecal</u>	<u>Total</u>
1-D	Drainage along south side of Hwy. No.11 flowing in a westerly direction towards railway culvert.	Sept.30/70	6,000	350,000
2-D	Drainage along south side of Hwy.No.11 flowing in an easterly direction towards railway culvert.	"	20	200
5-D	Drainage from rear of Esso Service Stn. and adjacent field at west end of community.	"	16,000	2,600,000
7-D	Drainage from rear of homes located on Hwy.No.11 at west end of community	"	42,000	800,000
8-D	Drainage through culvert under Hwy.No. 11 opposite Esso Service Stn. at east end of community	"	27,000	2,200,000
9-D	Drainage in ditch flowing in westerly direction on north side of Hwy.No.11 at west end of community	"	130,000	1,200,000
10-D	Drainage flowing in westerly direction on south side of Hwy.No.11	"	10	100

TABLE 2-A (cont'd)

Sampling Point No.	Location	Date	MPN Coliform Organisms per 100 ml.	
			Fecal	Total
12-D	Ditch on west side of Lane at west end of Notre Dame St.	Sept.30/70	88	180
13-D	Ditch on east side of Lane at east end of Notre Dame St.	"	160	4600
14-D	Ditch crossing north side of town- site from St. Anne St. to western limits.	"	3,000	32,000
17-D	Ditch on east side of Lane near corner of Hwy.No.11	"	84	760
18-D	Ditch on west side of St. Frances St. near Hwy. No.11	"	1300	8000
19-D	Ditch on east side of St. Joseph St. north of Notre Dame St.	"	340,000	8,000,000
22-D	Ditch on west side of St. Joseph St.	"	10,000	17,000
27-D	Ditch on north side of Hwy.No.11 at east end of community	"	60,000	260,000

TABLE 2-B

CHEMICAL ANALYSES OF LOCAL DITCH CONTENTS

Sampling Point No.	Location	Solids (ppm)			BOD ₅ (ppm)	Anionic Detergents as ABS (ppm)	Phenols (ppb)	Phosphorus as P
		Total	Susp.	Diss.				
1-D	Ditch on south side of Hwy. No.11 opposite Esso Service Stn.	490	20	470	15	0.2	10	2.7
5-D	Drainage from rear of Esso Service Stn. and adjacent field near west end of community	460	15	445	16	0.2	10	2.5
19-D	Ditch on east side of St. Joseph St.	710	70	640	16	1.5	5	6.7
22-D	Ditch on west side of St. Joseph St.	330	40	290	2.0	0.1	0	.13
27-D	Ditch on north side of Hwy. No.11 at east end of community	610	30	580	17	0.2	4	3.1

APPENDIX

SIGNIFICANCE OF LABORATORY RESULTS

APPENDIX

SIGNIFICANCE OF LABORATORY RESULTS

BACTERIOLOGICAL EXAMINATION

The presence of faecal coliforms (FC) is indicative of pollution from human or animal excrement. The total coliform count represents the total number of coliform organisms present of both faecal and non-faecal origin.

The OWRC laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probable Number (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Faecal Coliform Organisms (FC).

Sanitary Chemical Analyses

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm) and is an indicator of the amount of oxygen required for the stabilization of decomposable organic or chemical matter.

Solids

The value for solids, expressed in parts per million, is the sum of the values for the suspended and the dissolved solids in the water. The concentration of suspended solids is generally the most significant to

surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, decomposition in streams and injury to the habitat of fish.

Phenols

The presence of phenols or phenolic equivalents is generally associated with pollutants containing petroleum products or with some classes of industrial wastes.

Adequate protection of surface waters will be assured if the concentrations of phenols or phenolic equivalents in wastes do not exceed 20 parts per billion (ppb).

Anionic Detergents as (ABS)

The alkyl benzene sulfonate portion of the anionic detergents is reported in ppm. The test is generally employed to detect the presence of domestic wastes. The popular use of synthetic detergents for general cleaning purposes has resulted in the incidence of residual ABS in domestic waste discharges.

As an objective, the ABS concentration should not exceed 0.5 ppm in water used for domestic purposes.

Phosphorus as P

Detrimental concentrations of phosphorus

are usually present in domestic sanitary wastes. Phosphorus discharges to streams and other watercourses often result in an overabundant growth of algae and undesirable odours, and may be injurious to the habitat of fish. It is pointed out that detergents are an increasingly important source of phosphorus pollution.

It is suggested that a concentration of 0.01 ppm of inorganic (or soluble) phosphorus is the maximum value permissible without the danger of supporting undesirable growths.

Iron

The iron concentration in potable water should not exceed 0.3 parts per million to avoid objectionable tastes, staining and sediment formation.

Hardness as CaCO_3

The hardness of water reflects the nature of the geological formations with which it has been in contact. Hardness concentrations reflect little sanitary significance in water, but usually create domestic usage problems. These problems include excessive soap consumption, the toughening of cooked vegetables, and the formation of scales in boilers, hot water heaters, pipes, and utensils.

The above problems may be expected when domestic water supplies contain CaCO_3 concentrations in excess of 140 ppm.

Alkalinity

The alkalinity of natural waters is influenced by three major classes of materials which may be ranked in order of their effect on pH as follows: (1) hydroxides; (2) carbonates; and (3) biocarbonates and other salts of weak acids. The alkalinity of a water has little sanitary significance but is of importance in water, sewage, and industrial waste treatment practices.

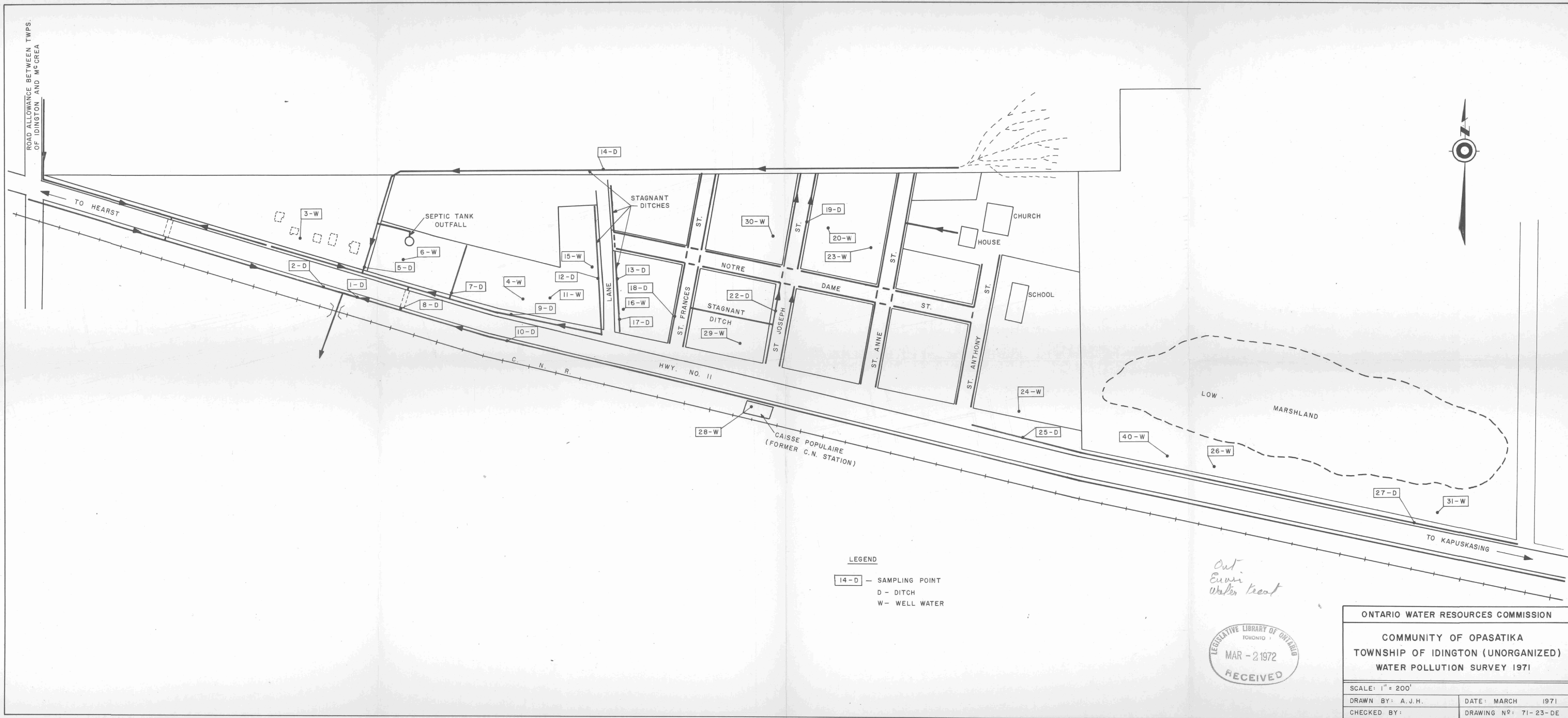
Chlorides

Chlorides in reasonable concentrations are not harmful to humans. Concentrations in excess of 250 ppm produce an objectionable, salty taste in the water. For this reason the OWRC Drinking Water Objectives limit chloride concentrations to 250 ppm maximum in public supplies.

pH

The pH value, for practical purposes, refers to the degree of acidity or alkalinity of a given liquid. The pH scale extends from zero (very acidic) to 14 (very alkaline), with the value of 7 corresponding to neutrality

at 25^o Centigrade. The OWRC's Drinking Water Objectives require public supplies to have a pH within the range of 6.0 to 8.5.





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